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TECHNICAL MEMORANDUM 51

AERONAUTIC INSTRUCTION IN GERMANY.

By

Henri Bouche.

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Translated from
"L'Aéronautique," May, 1921.

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By

Henri Bouché.

The following is a list of the courses relating to aeronautics announced in Germany, both in the technical high schools and in the universities.

T e c h n i c a l H i g h S c h o o l s .

In all these schools, excepting the one in Breslau, which is being reorganized, the technical student receives elementary aeronautical instruction and can elect special courses. We will indicate the relative importance of these courses by using the following abbreviations: C, course; E, practical exercises; H, hours per week; S, summer semester; W, winter semester.

Aerotechnics.

School	:	Subject	:	Lecturer
Aix-la-Chapelle	:	Introduction to flight tech-	:	Prof. Karman
	:	nics (C, 2H, S, W).	:	
Berlin-Charlot-	:	Elementary aerodynamics (C,	:	Prof. Everling
tenburg	:	1H, W); Mechanics of air-	:	
	:	planes (C, 1H, S).	:	
	:	Equilibrium and general motion	:	Dr. Fuchs
	:	of airplanes (C, 2H, W).	:	
Brunswick - - -	:	Flight principles and differ-	:	Prof. Schlink
	:	ent airplane types (C, 1H, W;	:	
	:	Aerostatics and aerodynamics:	:	

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	:	(C, 4H, E, 2H, S) (This	:
	:	course is part of the gener-	:
	:	al scheme of a broad treat-	:
	:	ment of technical mechanics	:
	:	by Prof. Schlink).	:
Dresden - - - -	:	Hydrodynamics and aerodynamics	Prof. Foeppel
	:	and their applications to	
	:	the theory of flight (C, 2H,	
	:	W; E, 1H, W, in a special	
	:	class.	
Hanover- - - -	:	Introduction to the statics of	Prof. Oesterlen
	:	airplanes (C, 1H, S).	
	:	Aeromechanics (C, 1H, W).	Prof. Proell
Darmstadt - - -	:	General course in aeronautics	Prof. Eberhardt
	:	(C, 2H, S).	
Aix - - - - -	:	General meteorology (C, 2H, S	Prof. Polis
	:	W).	
Berlin - - - - -	:	The science of the weather for	Prof. Kassner
	:	engineers (C, 1H, W); Source:	
	:	measurement and utilization	
	:	of the wind for technical	
	:	purposes (C, 1H, S).	
Darmstadt - - -	:	Aeronautic meteorology (C, 2H,	Prof. Linke, of
	:	W).	Frankfort Un'y.
Karlsruhe - - -	:	Meteorological practice (C, 1H,	Prof. Peppler
	:	W); General meteorology (C,	
	:	2H, S).	
Munich - - - -	:	Meteorology and climatology	Prof. Emden
	:	(C, 2H, W).	
Stuttgart - - -	:	Measurement of barometric al-	Prof. Hammer
	:	titudes (C, 1H, W).	

Free Balloons.

Stuttgart - - -	:	The free balloon and the con-	Prof. A. Baumann
	:	struction of airships (C, 3H;	
	:	S, W).	

Aeronautic Engines.

Berlin - - - -	:	Light internal combustion en-	:	Prof. Becker
	:	gines, aeronautic engines,	:	
	:	airplane engines, (C, 2H, W,	:	
	:	S).	:	
	:	Aeronautic engines (C, 2H, S)	:	Prof. Romberg
	:	(Prof. Romberg holds, in	:	
	:	fact, the chair of marine	:	
	:	gasoline engines. The rec-	:	
	:	ent change in his assignment:	:	
	:	is worthy of remark.)	:	

Airships.

Berlin - - - -	:	Airships (C, 2H, W).	:	Prof. Parseval
	:		:	
Dantzic - - - -	:	(Prof. Schuette lectures offi-	:	
	:	cially this year only on nav-	:	
	:	al construction, but this	:	
	:	apostle of the airship is a	:	
	:	technical adviser for the	:	
	:	youth of the university.)	:	
	:		:	
Darmstadt - - -	:	Aerial navigation by airship	:	Prof. Eberhardt
	:	(C, 2H, W, S).	:	
	:		:	

Airplanes.

Berlin - - - -	:	Airplanes (C, 2H, S, W).	:	Prof. Parseval
	:		:	
	:	Practical exercises in air-	:	Prof. Parseval
	:	plane construction (E, 2H,	:	and Everling.
	:	W).	:	
Dantzic - - - -	:	Airplane construction (C, 1H,	:	Prof. Rieppel
	:	S).	:	
	:	Practice in airplane construc-	:	Instructor Gaul
	:	tion (C, 2H, W; 3H, S).	:	
	:		:	
Darmstadt - - -	:	Technics of aeronautical con-	:	Prof. Eberhardt
	:	struction (C, 2H, S; W).	:	
	:		:	
Hanover - - - -	:	Airplane construction (C, 2H,	:	Prof. Proell
	:	S).	:	

Propellers.

Dantzig - - - - : Aerial and marine propellers : Prof. Foettinger
: (C, 2H, S, W; E, 2H, S, W). :
: :
Darmstadt - - - : Theory and calculation of aer- : Prof. Eberhardt
: ial propellers (C, 2H, S, W; :
: E, 2H, S, W). :
: :

Instruments.

Berlin - - - - : Gyroscopic instruments (C, 1H, : Prof. Everling
: W); Aerial navigation in- :
: struments (C, 1H, S). :
: :

Applications.

Darmstadt - - - : Aerial photo-topography (C, 2H: Dr. Gasser
: S, and 3 days practice on :
: the field.) :

There are also departments of aeronautical technics, subsidized by the government, like the one over which Prof. Schlink presides at Brunswick, Prof. Schuette's laboratory at Dantzig, and Prof. Emden's Association of Aeronautical Technics at Munich. Lastly, a special mention should be made of the department for experiments on airplanes in flight, connected with the technical school at Hanover, the founding of which was due to the intelligent generosity of the "Hannoverische Waggonfabrik" which makes the Hava airplanes.

Universities.

In Germany the plan which seems to prevail with regard to aeronautic instruction, is the following: The technical high schools produce aeronautical engineers while the universities are

expected to supply the future teachers, mathematicians, and physicists with general aeronautic knowledge, which will make them well-informed propagandists and "awakeners" of the youth.

It is therefore through the special attention given aeronautics in the broad general courses of mathematical and experimental physics, of atmospheric physics, of the theories and technics of machines and engines, of metallurgy, etc., that the future professors and scientists of Germany will be instructed.

The universities should, moreover, by means of special courses, produce aerodynamic and meteorological experts, fitted to continue the work of the Prandtls, Karmans and Betzes. At the University of Göttingen, there is already being developed, about Prandtl and his associates, a school for developing and transmitting aerodynamic knowledge.

Similar schools exist at Leipzig, with Otto Wiener; at Halle with Albert Wigand; at Hanover, with Gorrissen. Very soon, thanks to a vigorous campaign, all these 22 universities will assist in making a place for aeronautics in German science.

Let us call attention to the recent creation at Cologne, as an annex to the university, of an "Institute for the Study of Transportation," in which special attention will be given to aerial transportation.

The professors of the great German universities say that the methods of calculation in vogue in the technical courses are improved by their aeronautical application and that they constitute

intellectual gymnastics of great pedagogical value. They say that aeronautic technicians have already reacted on the other branches of applied mechanics. Lastly, they express confidence in the future of aircraft.

The scientists and professors who speak thus are also Germans and believe in the greatness of Germany. Prof. Parseval wrote: "It is clear that, in the near future, our aeronautic construction, under the oppression of the Entente, will be insignificant and that we will have use in Germany for only a few trained engineers, but many students will be educated in aeronautics with the idea of carrying their knowledge to foreign countries."

Thus, without regard to our action, aeronautic instruction, as now being organized, assures to Germany:

1. A class of superior aeronautic technicians, educated in the universities in contact with the present scientists, whom they will succeed;
2. Many engineers of aeronautic construction, some of whom will be employed in the offices of research and the shops which Germany will still be able to retain, the exportation of the excess products creating markets for German industries;
3. Science teachers, who will attract the youth and keep up the interest in aeronautics.

We have no fear of this effort, which seems perfectly reasonable to us. In France there are technicians, professors and scientists who also wish to advance aeronautics. There is "L'Ecole

supérieure d'Aéronautique" where, under the direction of Colonel Roche, engineers are instructed by experienced specialists. There are the courses of Mr. Marchis at the Sorbonne, of Mr. Soreau at the "Arts et Métiers" and of Mr. Rothé at Strassburg. "L'Ecole supérieure des Travaux publics" has already established a course in aeronautics. Grenoble and Caen have given it a place in their curriculum. We hope every French university and technical school will give aeronautics the consideration it demands. If they have not already done so, we are confident that it will only be necessary to call the attention of the proper authorities to this great question.

Translated by the National Advisory Committee for Aeronautics.

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